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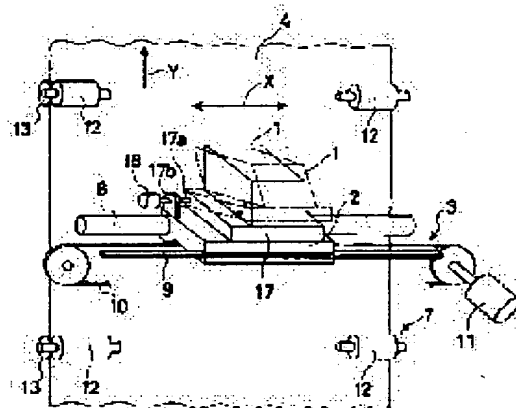
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## (54) IMAGE RECORDING APPARATUS

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To faithfully record image data of various resolving powers by making the relative angle of the arranging direction of the respective recording elements of a recording head and the transfer direction of a recording medium variable corresponding to a selected recording mode and allowing the recording dot pitch in a sub-scanning direction to coincide with the selected recording mode.

**SOLUTION:** A recording head 1 is fixed on an operation stand 17 and the operation stand 17 is supported on a carriage 2 in a revolvable manner through a shaft 17 and a bearing 17b and revolved by a mode changeover pulse motor 18 being a dot pitch adjusting means to be positioned at a predetermined angle. That is, in the recording head 1, a predetermined number of recording elements are arranged at a predetermined interval along a sub-scanning direction Y and the relative angle of the arranging direction of the recording elements and the transfer direction of recording paper 4 is made variable to allow the recording dot pitch in the sub-scanning direction to coincide with a selected recording mode. By this constitution, image data of various resolving powers can be faithfully recorded.



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CLAIMS

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[Claim(s)]

[Claim 1] The recording head which two or more record components are arranged at intervals of predetermined, and record in the direction of vertical scanning which intersects perpendicularly with the main scanning direction to a record medium in a dot-matrix format, A data supply means to supply the dot data corresponding to arrangement of said record component to said record component, A scan means to make record data record on said record medium by making said recording head scan to a main scanning direction, A migration means to transport said record medium in the direction of vertical scanning relatively to said recording head, A mode selection means to choose two or more recording modes from which a record dot pitch differs mutually, According to the recording mode chosen with said mode selection means, it carries out adjustable [ of whenever / angular relation / of the array direction of each of said record component of said recording head, and the migration direction of said record medium ]. Image recording equipment characterized by having a dot pitch adjustment means to adjust so that it may agree in the recording mode which had the record dot pitch of the direction of vertical scanning chosen.

[Claim 2] In claim 1, when the recording mode of a twice [ more than ] as many big record dot pitch as this is chosen to the array pitch of each record component of said recording head by said mode selection means When it controls to make said each recording head drive alternately [ at least ] and the recording mode of a small record dot pitch is chosen from the array pitch of each record component of said recording head by said mode selection means Image recording equipment characterized by having the control means which controls said migration means to record a dot line further between the dot lines recorded with said record component.

[Claim 3] The recording head which two or more record components are arranged at intervals of predetermined, and record in the direction of vertical scanning which intersects perpendicularly with the main scanning direction to a record medium in a dot-matrix format, A data supply means to supply the dot data corresponding to arrangement of said record component to said record component, A scan means to make record data record on said record medium by making said recording head scan to a main scanning direction, While having a migration means to transport said record medium in the direction of vertical scanning relatively to said recording head, and a mode selection means to choose two or more recording modes from which a record dot pitch differs mutually While making each whole part counterpose at equal intervals by consisting a gap and arranging mutually the array part of each record component of each of said recording head, and the logged point of said record medium according to said recording head at least in the shape of [ of this alignment ] radii Image recording equipment characterized by having the control means which carries out adjustable control of the spacing of this recording head and record medium so that it may agree in the record dot pitch of the recording mode chosen with said mode selection means.

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[Translation done.]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image recording equipment suitable for recording the offseeds from which a record dot pitch differs mutually in what carries out a relative scan and records for example, an ink jet type recording head on a record medium in a dot-matrix format.

[0002]

[Description of the Prior Art] Generally, by the printer, the image data of the resolution of 300dpi x 300dpi is recorded to recording the image data of the resolution of 200dpi (main scanning direction) x 100dpi (the direction of vertical scanning) (or the subactuation direction 200dpi or 400dpi) in facsimile apparatus. Therefore, the record component is arranged in the pitch of 1/200 inch in the rectangular direction to the main scanning direction to a record medium, and, on the other hand, as for the recording head of facsimile apparatus, the record component is arranged in the pitch of 1/300 inch in the above and this direction by the recording head of a printer.

[0003] In recent years, the equipment which has two or more image recording functions has appeared on the market like the printer which had the facsimile apparatus which had printer ability, and a facsimile function. In case the image data of resolution other than the resolution of the immobilization uniquely decided by the recording head is recorded, input image data is changed into the image data made to approximate to the resolution of the above-mentioned immobilization with a software-algorithm, and it is recording based on the data.

[0004]

[Problem(s) to be Solved by the Invention] For example, when recording the facsimile image data of 200dpi x 200dpi by the printer for 300dpi, to the main scanning direction of a recording head, the migration speed and output energy of a recording head are controlled to become the dot pitch and the diameter of a dot of 200dpi. However, since the dot pitch of the direction of vertical scanning is determined in the arrangement pitch of the record component of a recording head, it is uncontrollable. Then, one attached processing is performed to two pieces to the dot data of 200dpi, the image data of 300dpi is created in approximation, and it is recording based on the created image data. Therefore, a subject copy cannot be recorded faithfully but there is a problem that moire (blot of a striped pattern) arises and image quality deteriorates.

[0005] Then, in order to solve the above-mentioned problem, while having the recording head of offseeds The equipment which chooses the recording head corresponding to the resolution of input image data, and was made to record image data (For example, refer to JP,3-259657,A) By switching whenever [ over the direction of vertical scanning of a recording head / angle-of-inclination ] so that it may agree in the dot pitch according to input image data The equipment (for example, refer to publication-number 6 or -286140 [ No. ] official report) which records the input image data of various resolution faithfully is proposed.

[0006] However, the former equipment has the fault which the number of recording heads also increases in connection with it, and a configuration is enlarged, and serves as the cost high, when the class of image data which should be recorded increases. On the other hand, since the latter equipment changes the record location of the direction of vertical scanning to the main

scanning direction list of image data according to the inclination of a recording head, respectively, processing of data conversion becomes complicated and a limit is in the recordable class of image data.

[0007] The place which this invention is made in view of such a trouble that a Prior art has, and is made into the object is to offer the image recording equipment which can record the image data of various resolution faithfully by the comparatively easy configuration, without requiring transform processing of complicated image data.

[0008]

[Means for Solving the Problem] The image recording equipment applied to claim 1 in order to attain the above-mentioned object The recording head which two or more record components are arranged at intervals of predetermined, and record in the direction of vertical scanning which intersects perpendicularly with the main scanning direction to a record medium in a dot-matrix format, A data supply means to supply the dot data corresponding to arrangement of said record component to said record component, A record means to make record data record on said record medium by making said recording head scan to a main scanning direction, A migration means to transport said record medium in the direction of vertical scanning relatively to said recording head, A mode selection means to choose two or more recording modes from which a record dot pitch differs mutually, According to the recording mode chosen with said mode selection means, it carries out adjustable [ of whenever / angular relation / of the array direction of each of said record component of said recording head, and the migration direction of said record medium ]. It considers as the configuration equipped with a dot pitch adjustment means to adjust so that it may agree in the recording mode which had the record dot pitch of the direction of vertical scanning chosen. By this If the recording mode corresponding to record data is chosen with a mode selection means when recording the record data with which record dot pitches differ Adjustable [ of whenever / angular relation / of the array direction of each record component of a recording head and the migration direction of a record medium ] is carried out, and it is adjusted so that it may agree in the recording mode as which the record dot pitch of the direction of vertical scanning was chosen. By the comparatively easy configuration It realizes recording the image data of various resolution faithfully, without requiring transform processing of complicated image data.

[0009] In claim 1, when the recording mode of a twice [ more than ] as many big record dot pitch as this is chosen to the array pitch of each record component of said recording head by said mode selection means, the image recording equipment concerning claim 2 When it controls to make said each recording head drive alternately [ at least ] and the recording mode of a small record dot pitch is chosen from the array pitch of each record component of said recording head by said mode selection means It considers as the configuration equipped with the control means which controls said migration means so that a dot line may be further recorded between the dot lines recorded with said record component, and this realizes recording the image data of various resolution faithfully by comparatively easy processing.

[0010] The recording head which two or more record components are arranged at intervals of predetermined, and records the image recording equipment concerning claim 3 in the direction of vertical scanning which intersects perpendicularly with the main scanning direction to a record medium in a dot-matrix format, A data supply means to supply the dot data corresponding to arrangement of said record component to said record component, A scan means to make record data record on said record medium by making said recording head scan to a main scanning direction, While having a migration means to transport said record medium in the direction of vertical scanning relatively to said recording head, and a mode selection means to choose two or more recording modes from which a record dot pitch differs mutually While making each whole part counterpose at equal intervals by consisting a gap and arranging mutually the array part of each record component of each of said recording head, and the logged point of said record medium according to said recording head at least in the shape of [ of this alignment ] radii It considers as the configuration equipped with the control means which carries out adjustable control of the spacing of this recording head and record medium so that it may agree in the record dot pitch of the recording mode chosen with said mode selection means. Like claim 1 by

the comparatively easy configuration It realizes recording the image data of various resolution faithfully, without requiring transform processing of complicated image data.

[0011]

[Embodiment of the Invention] It explains referring to a drawing about the gestalt of desirable operation of this invention hereafter. Drawing 1 is the outline perspective view showing the mechanical configuration of the image recording equipment concerning the gestalt of 1 operation of this invention. In this drawing, a recording head 1 is carried in carriage 2, a both-way scan is carried out in the main scanning direction X which met the line writing direction of record of a record medium 4, for example, a record form, with the scan means 3, and the record form 4 is transported in the direction Y of vertical scanning which intersects perpendicularly with a main scanning direction X with the migration means 7 for the scan of every.

[0012] The above-mentioned scan means 3 consists of a below-mentioned control section, the guide shaft 8 and guide rail 9 which support carriage 2 possible [ sliding of a main scanning direction X ], and the driving source 11 which carries out the both-way scan of the carriage 2 through a belt 10 in a main scanning direction X, for example, CR motor, which controls the CR motor 11. The migration means 7 consists of a below-mentioned control section, four paper-feed driving rollers 12 which rotate around an axis parallel to the record form 4, a paper feed follower roller 13 counterposed by this paper feed driving roller 12, respectively, and the driving source 14 which carries out revolution actuation of the above-mentioned paper feed drive motor 12, for example, LF motor which illustrates to drawing 2 , which controls that LF motor 14.

[0013] A recording head 1 is fixed on the actuation base 17. This actuation base 17 is supported by carriage 2 rotatable through shaft 17a and bearing 17b. Therefore, the actuation base 17 rotates by the pulse motor 18 for a mode change-over, and is positioned by the predetermined include angle at accuracy. That is, record \*\*\*\*\* of the predetermined number is arranged at intervals of predetermined along the direction Y of vertical scanning so that it may mention later, and a recording head 1 is rotated by the pulse motor 18 so that the array direction of the record component may become a predetermined include angle to the record form 4.

[0014] Drawing 2 is the outline block block diagram showing the electric control configuration of above image recording equipment, and explains the ink jet printer which usually records the record data of 300dpix300dpi with the gestalt of this operation. In this drawing, a recording head 1 meets in the direction Y of vertical scanning of drawing 1 , and it is 1s of many record components to regular intervals. Since it is the ink jet printer which records the record data of 300dpix300dpi as mentioned above, image recording equipment [ in / it is arranged and / the gestalt of this operation ] is 1s of record components. It is arranged in the pitch which is 1/300 inch. 1s of moreover, many record components It is set as one line of the usual character string, and array die length is 1s of record components. It is a nozzle for turning an ink droplet to the record form 4 with the gestalt of this operation, and spouting. In addition, what is recorded in dot-matrix formats, such as a thermal head, as a recording head 1 is usable.

[0015] The image data created in the image data or the data origination section (not shown) transmitted from the transmitting-side facsimile which is not illustrated, a computer, etc. in drawing 2 is 1s of record components of a recording head 1 by the data array circuit 19. It is arranged by the dot map data which make one line a row by making a number into a column, and is stored in buffer memory 20. In addition, buffer memory 20 is 1s of record components. It has a storing field corresponding to the same line count as a number.

[0016] The data supply means for supplying dot data to a recording head 1 is constituted from buffer memory 20 by the readout circuitry 21, the shift register 22, and latch circuit 23 containing odd-line read-out section 21a and even-line read-out section 21b. A readout circuitry 21 is beginning to read 1 bit of data at a time from buffer memory 20 in response to the command of the central processing unit 29 which is the control section of the whole equipment, and outputs them to a shift register 22. A shift register 22 is 1s of record components in it. It has an every two or more bits storing field in the line count of the same number, respectively. A latch circuit 23 stores 1 bit at a time from each line of a shift register 22, synchronizes the data with the record timing signal of the record timing circuit 24, and is 1s of each record component. It outputs to the corresponding head actuation circuit 27.

[0017] The command of a central processing unit 29 is controlled by the carrier beam head actuation timing circuit 32, and the head actuation circuit 27 is 1s of each record component. It drives to predetermined timing. That is, the head actuation circuit 27 is 1s of each record component at which timing of the same timing mentioned later, the 1st timing, and the 2nd timing. It drives to predetermined timing. 1s of each record component It operates based on record data and an ink droplet is spouted towards the record form 4.

[0018] With the mode selection means 33, the recording mode from which a record dot pitch differs mutually is alternatively chosen by an operator's manual operation or autonomous working. Since the ink jet printer is illustrated with the gestalt of this operation, when recording the record data of facsimile, the recording mode of either normal mode (200dpix100dpi), fine mode (200dpix200dpi) and super fine mode (200dpix400dpi) is chosen by the mode selection means 33 according to the data of transmitting-side facsimile, for example.

[0019] While a central processing unit 29 reads the control data beforehand memorized by RAM30 based on the recording mode chosen with the above-mentioned mode selection means 33, according to the software program of ROM31, the whole equipment is controlled by the microcomputer 28. Namely, while making a central processing unit 29 a response at the selected recording mode, carrying out the roll control of the pulse motor 18 for a mode change-over through the pulse motor actuation circuit 34 and making a recording head 1 incline at the include angle corresponding to a recording mode 1s of each record component according to the head actuation circuit 27 through the head actuation timing circuit 32 Actuation timing is set up. Furthermore, the data of the scan speed of the recording head 1 2 corresponding to a recording mode, i.e., carriage, are read from RAM30, and CR motor rate change-over circuit 37 is switched based on the data.

[0020] CR motor rate change-over circuit 37 usually controls the rotational speed of the CR motor 11 through the CR motorised circuit 38 based on the switched setting-out rate they to be [ high-speed any / a rate or ], and controls it to be able to record the migration speed of a recording head 1 by the dot pitch corresponding to the resolution of input image data. 1s of namely, each record component of a recording head 1 When recording the image data (the gestalt of this operation record data of facsimile) of resolution other than the resolution set up by the array pitch, he is trying to record by controlling the passing speed of a recording head 1 about a main scanning direction X by the record dot pitch corresponding to the recording mode as which the \*\*\*\* was chosen.

[0021] He is trying to agree in the record dot pitch of the selected recording mode by carrying out adjustable setting of the include angle to the record form 4 of a recording head 1 about the direction Y of vertical scanning in the case of on the other hand recording the image data of resolution other than the resolution determined by the recording head 1. These data are computed beforehand, and are set as RAM30, and a central processing unit 29 reads and controls the data corresponding to the selected recording mode. Furthermore, a central processing unit 29 sets up the specific migration pitch read from RAM30 to LF motor pitch change-over circuit 39, only when the above-mentioned super fine mode is chosen by the mode selection means 3. LF motor pitch change-over circuit 39 carries out the roll control of the LF motor 14 through the LF motorised circuit 40 so that only the include angle corresponding to the set-up pitch may be rotated.

[0022] Below, an operation of above image recording equipment is explained, referring to drawing 3, the flow chart of 4, and the explanatory view of drawing 5. First, the recording mode as which the central processing unit 29 was chosen by the mode selection means 33 distinguishes whether it is 300dpi (step S1). The mode selection means 33 is not operated here, when recording the image data of the resolution of the immobilization corresponding to a recording head 1, but only when recording image data other than the resolution of immobilization, it shall be operated so that the resolution of the image data may be chosen. When the mode selection means 33 is not operated now, it judges that a central processing unit 29 is the resolution of immobilization of 300dpix300dpi, and the data array circuit 19 is ordered the array of the data for one line of image data (step S2). For the carrier beam data array circuit 19, the resolution of input image data is 1s of record components of a recording head 1 about that command. 1s of

record components of a recording head 1 since the array pitch is supported. It only arranges to the dot map data which make a number a column and make required one line a row at intervals of 300dpi, and this data is stored in buffer memory 20.

[0023] Continuing, a central processing unit 29 orders it read-out of the data for one train of the column of buffer memory 20 to both the read-out sections 21a and 21b of a readout circuitry 21 (step S3). Thereby, 1 bit of data which the readout circuitry 20 read 1 bit of data for one train at a time from buffer memory 19, outputted it to the shift register 22, and were stored in the shift register 22 is outputted at a time, and they are stored in a latch circuit 23. A latch circuit 23 outputs data to the head actuation circuit 27 corresponding to 1s of each record component synchronizing with the record timing signal from the record timing circuit 24. 1s of each record component It operates based on the data and an ink droplet is spouted towards the record form 4. In this case, the pulse motor 18 since it is the image data of the resolution of immobilization is 1s of each record component, as it does not drive but is shown in drawing 5 (a). The array is located in parallel to the record form 4, and is recorded on the record form 4 by the 1/300 inch dot pitch which is the resolution of immobilization. Moreover, since Men of the record component of a recording head 1 and the record form 4 are parallel, it is simultaneous also in the MIIGU from the record timing circuit 24.

[0024] Since a central processing unit 29 reads the rate data of the CR motor 11 corresponding to 300dpi from RAM30 and sets them as CR motor rate change-over circuit 37 at the same time it orders it read-out of the above-mentioned record data, the CR motorised circuit 38 controls the rotational speed of the CR motor 11 based on the rate data with which the above was set up. Therefore, for a recording head 1, the resolution of input image data is 1s of record components while usually being moved to the main scanning direction X at the rate by carriage 2 (step S4). Since the array pitch is supported, whenever carriage 2 moves by 300dpi, 1s of each record component drives to the same timing through the head actuation circuit 27 by the head actuation timing circuit 32, and an ink droplet is spouted (step S5). It is repeated until actuation of this step 2 to the step 5 is distinguished as record of the data for one line was completed (step S6).

[0025] It means that termination of migration to the main scanning direction X of a recording head 1 had recorded the record data for one line in the resolution of 300dpix300dpi. It orders so that a central processing unit 29 may usually rotate the LF motor 14 in a pitch to LF motor pitch change-over circuit 39 after it (step S7). Then, it distinguishes whether there are whether record actuation having been completed and input image data that is, (step S8), and the same actuation as \*\*\*\* is repeated until input image data is lost.

[0026] Next, [ when the image data from facsimile is inputted ], when it distinguishes that the normal mode which is the resolution of 200dpix100dpi was chosen in the mode selection means 33 (step S9), a central processing unit 29 orders it a pulse motor 18 through the pulse motor actuation circuit 34 based on the control data read from RAM30, so that only the include angle of 41 degrees may be rotated (step S10). Thereby, as shown in drawing 5 (b), only 41 degrees of recording heads 1 are leaned to the record form 4. Then, a central processing unit 29 orders the data array circuit 19 the array of the data for one line of image data (step S11). Here, the data array circuit 19 arranges image data to the dot map data which made dummy data intervene between each bit, and stores this data in buffer memory 20.

[0027] Continuing, a central processing unit 29 orders it read-out of the data for one train of the column of buffer memory 20 to odd number read-out section 21a of a readout circuitry 21 (step S12). Thereby, 1 bit of data which the readout circuitry 20 intervened DAMIDETA from buffer memory 19, read 1 bit of data for one train at a time, outputted it to the shift register 22, and were stored in the shift register 22 is outputted at a time, and they are stored in a latch circuit 23. A latch circuit 23 outputs data to the head actuation circuit 27 synchronizing with the record timing signal from the record timing circuit 24. Therefore, as shown in drawing 5 (b), it is 1s of each record component of odd lines. Since it operates based on data and an ink droplet is spouted towards the record form 4, it is recorded on the record form 4 by the 1/100 inch dot pitch to the direction Y of vertical scanning.

[0028] Since a central processing unit 29 reads the high-speed rate data of the CR motor 11



corresponding to 200dpi from RAM30 to actuation and coincidence of the above-mentioned recording head 1 and sets them as them at CR motor rate change-over circuit 37, to them, the CR motorised circuit 38 controls the rotational speed of the CR motor 11 based on the high-speed data with which the above was set up. Therefore, a recording head 1 minds the head actuation circuit 27 by the head actuation timing circuit 32, whenever carriage 2 moves by 200dpi, while being moved to the main scanning direction X at high speed by carriage 2 (step S13), and it is 1s of each record component. It drives to the 1st timing and an ink droplet is spouted (step S14).

[0029] the condition that the recording head 1 inclined 41 degrees to the record form 4 as the 1st above-mentioned timing was shown in drawing 5 (b) — setting — 1s of each record component from — the breathed-out ink droplet reaches the record form 4 almost simultaneous — as — 1s of each record component It receives, and it was set up and storage setting out of this timing data is carried out beforehand at RAM30. By a central processing unit's 29 reading this timing data, and setting it as the head actuation timing circuit 32, it is 1s of each record component. It drives to the 1st timing. It is repeated until actuation of this step 11 to the step 14 is distinguished as record of the data for one line was completed (step S15). After record for one line is completed, it distinguishes whether it orders so that a central processing unit 29 may usually rotate the LF motor 14 in a pitch to LF motor pitch change-over circuit 39, and there is any input image data after \*\* (step S16) (step S17), and the same actuation as \*\*\*\* is repeated until input image data is lost.

[0030] Moreover, based on the control data read from RAM30, when it distinguishes that the fine mode which is the resolution of 200dpix200dpi was chosen in the mode selection means 33 (step S18), a central processing unit 29 orders it a pulse motor 18 through the pulse motor actuation circuit 34 so that only the include angle of 48 degrees may be rotated (step S10). Thereby, as shown in drawing 5 (c), only 48 degrees of recording heads 1 are leaned to the record form 4. Then, a central processing unit 29 orders the data array circuit 19 the array of the data for one line of image data (step S20). The carrier beam data array circuit 19 is 1s of record components of a recording head 1 about that command. It arranges to the dot map data which make a number a column and make required one line a row at intervals of 200dpi, and this DETATA is stored in buffer memory 20.

[0031] Continuing, a central processing unit 29 orders it read-out of the data for one train of the column of buffer memory 20 to odd number read-out section 21a of a readout circuitry 21, and even number read-out section 21b (step S21). Thereby, a latch circuit 23 outputs data to the head actuation circuit 27 like \*\*\*\* synchronizing with the record timing signal from the record timing circuit 24. 1s of therefore, each record component Since it operates based on data and an ink droplet is spouted towards the record form 4, as shown in drawing 5 (c), it is recorded on the record form 4 by the 1/200 inch dot pitch to the direction Y of vertical scanning.

[0032] To actuation and coincidence of the above-mentioned recording head 1, a central processing unit 29 Since the high-speed rate data of the CR motor 11 corresponding to 200dpi are set as CR motor rate change-over circuit 37 The CR motorised circuit 38 controls the rotational speed of the CR motor 11 based on this high-speed data. While being moved to the main scanning direction X at high speed by carriage 2 (step S22), a recording head 1 Whenever carriage 2 moves by 200dpi, the head actuation circuit 27 is minded by the head actuation timing circuit 32, and it is 1s of each record component. It drives to the 2nd timing and an ink droplet is spouted (step S23).

[0033] the condition that the recording head 1 inclined 48 degrees to the record form 4 as the 2nd above-mentioned timing was shown in drawing 5 (c) — setting — 1s of each record component from — the breathed-out ink droplet reaches the record form 4 almost simultaneous — as — 1s of each record component It receives, and it was set up and storage setting out also of this timing data is carried out beforehand at RAM30. By a central processing unit's 29 reading this timing data, and setting it as the head actuation timing circuit 32, it is 1s of each record component. It drives to the 2nd timing. It is repeated until actuation of this step 20 to the step 23 is distinguished as record of the data for one line was completed (step S24). After record for one line is completed, it distinguishes whether it orders so that a central processing unit 29 may

usually rotate the LF motor 14 in a pitch to LF motor pitch change-over circuit 39, and there is any input image data after \*\* (step S25) (step S26), and the same actuation as \*\*\*\* is repeated until input image data is lost.

[0034] Furthermore, based on the control data read from RAM30, when it distinguishes that the super fine mode which is the resolution of 200dpi×400dpi was chosen in the mode selection means 33 (step S18), a central processing unit 29 orders it a pulse motor 18 through the pulse motor actuation circuit 34 so that only the include angle of 48 degrees may be rotated like \*\*\*\* (step S27). Thereby, as shown in drawing 5 R> 5 (c), only 48 degrees of recording heads 1 are leaned to the record form 4. Then, a central processing unit 29 orders the data array circuit 19 the array of the data for one line of image data (step S28). The carrier beam data array circuit 19 is 1s of record components of a recording head 1 about that command. It arranges to the dot map data which make a number a column and make required one line a row at intervals of 200dpi, and this DETATA is stored in buffer memory 20.

[0035] Continuing, a central processing unit 29 orders it read-out of the data for one train of the column of buffer memory 20 to odd number read-out section 21a of a readout circuitry 21 (step S29). Since a latch circuit 23 outputs data of only odd lines to the head actuation circuit 27 by the same actuation as \*\*\*\* by that cause synchronizing with the record timing signal from the record timing circuit 24, it is 1s of each record component of odd lines. It operates based on data and an ink droplet is spouted towards the record form 4. As shown in drawing 5 (c), it is recorded on the record form 4 by the 1/200 inch dot pitch to the direction Y of vertical scanning.

[0036] To actuation and coincidence of the above-mentioned recording head 1, a central processing unit 29 Since the high-speed rate data of the CR motor 11 corresponding to 200dpi are set as CR motor rate change-over circuit 37 The CR motorised circuit 38 controls the rotational speed of the CR motor 11 based on this high-speed data. While being moved to the main scanning direction X at high speed by carriage 2 (step S30), a recording head 1 Whenever carriage 2 moves by 200dpi, the head actuation circuit 27 is minded by the head actuation timing circuit 32, and it is 1s of each record component. It drives to the 2nd timing and an ink droplet is spouted (step S31).

[0037] It is repeated until actuation of this step 28 to the step 31 is distinguished as record of the data for one line of only odd lines was completed (step S32). After record for one line is completed, it orders so that a central processing unit 29 may rotate the LF motor 14 to LF motor pitch change-over circuit 39 only in a specific include angle, and, thereby, the record form 4 is transported only for a 1/400 inch pitch (step S33). Thereby, it is 1s of each record component. It is located so that it may counter between the dots [ finishing / record ] in the record form 4.

[0038] Next, a central processing unit 29 orders it read-out of the data for one train of the column of buffer memory 20 to even number read-out section 21b of a readout circuitry 21 (step S34). Since a latch circuit 23 outputs data of only even lines to the head actuation circuit 27 by the same actuation as \*\*\*\* by that cause synchronizing with the record timing signal from the record timing circuit 24, it is 1s of each record component of even lines. It operates based on data and an ink droplet is spouted towards the record form 4. As shown in drawing 5 (c), a new dot will be recorded between dots [ finishing / record ] by the record form 4, consequently it will be recorded on it by the 1/400 inch dot pitch to the direction Y of vertical scanning.

[0039] To actuation and coincidence of the above-mentioned recording head 1, the CR motorised circuit 38 controls the rotational speed of the CR motor 11 based on high-speed data. While being moved to the main scanning direction X at high speed by carriage 2 (step S35), a recording head 1 Whenever carriage 2 moves by 200dpi, the head actuation circuit 27 is minded by the head actuation timing circuit 32, and it is 1s of each record component. It drives to the 2nd timing and an ink droplet is spouted (step S36).

[0040] It is repeated until actuation from the above-mentioned step 34 to step 36 is distinguished as record of the data for one line of only even lines was completed (step S37). After record for one line is completed, it distinguishes whether it orders so that a central processing unit 29 may usually rotate the LF motor 14 in a pitch to LF motor pitch change-over

circuit 39, and there is any input image data after \*\* (step S38) (step S29), and the same actuation as \*\*\*\* is repeated until input image data is lost.

[0041] With this image recording equipment, arrangement of the dot in a main scanning direction X corresponds to the resolution of image data, and it is the passing speed and 1s of record components of the CR motor 11. Since it is controlled by actuation timing, no complicated data-conversion processing is needed, but arrangement of the dot in the direction Y of vertical scanning can respond by whenever [ angle-of-inclination / of a recording head 1 ]. Therefore, it becomes possible to record the image data of various resolution faithfully by the very easy configuration. In addition, although the operation gestalt mentioned above explained the case where a record medium was transported in the subactuation direction to a recording head, the configuration of transporting a recording head in the subactuation direction to a record medium may be used.

[0042] Drawing 6 and drawing 7 are the outline block diagrams showing the mode of other operations of this invention, respectively. A recording head 1 curves in the shape of [ convex ] radii, and the equipment of drawing 6 is 1s of record components to this part. It is arranged at equal intervals at the radial, the logged point by the record beef fat 1 of the record form 4 is arranged in the shape of [ of a recording head 1 and this alignment ] radii, and it is 1s of record components of this record form 4 and a recording head 1. The array part is arranged concentrically. Therefore, in the above-mentioned embodiment, it receives a thing, and the equipment of this embodiment can only carry out the variation rate of the record form 4 so that spacing to a recording head 1 which changed the inclination to the record form 4 of a recording head 1 may change, and it can change the record dot pitch of the direction Y of vertical scanning into arbitration. Moreover, drawing 7 is 1s of record components. The ink droplet is 1. It is arranged so that it may converge on a point, too, the variation rate of the record form 4 can only be carried out so that spacing to a recording head 1 may change, and the record dot pitch of the direction Y of vertical scanning can be changed into arbitration.

[0043]

[Effect of the Invention] As mentioned above, the image recording equipment concerning claim 1 If the recording mode corresponding to record data is chosen with a mode selection means when recording the record data with which record dot pitches differ Since adjustable [ of whenever / angular relation / of the array direction of each record component of a recording head and the migration direction of a record medium ] was carried out and it considered as the configuration adjusted so that it may agree in the recording mode as which the record dot pitch of the direction of vertical scanning was chosen By the comparatively easy configuration of only adjusting whenever [ recording head or angle-of-inclination / of a record medium ], the image data of various resolution can be recorded faithfully, without requiring transform processing of complicated image data.

[0044] The image recording equipment concerning claim 2 can record the image data of various resolution faithfully by comparatively easy processing.

[0045] In addition to the effectiveness which can record the image data of various resolution faithfully, the image recording equipment concerning claim 3 has the effectiveness whose cost simplifies a configuration further and can be cut down like claim 1, without requiring transform processing of complicated image data.

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[Translation done.]

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the outline perspective view showing the machine drop configuration of the image recording equipment concerning the gestalt of 1 operation of this invention.

[Drawing 2] It is the outline block block diagram showing the electric configuration of equipment same as the above.

[Drawing 3] It is the flow chart which shows control processing of equipment same as the above.

[Drawing 4] It is the flow chart which shows control processing of equipment same as the above.

[Drawing 5] It is an explanatory view for explaining actuation of equipment same as the above.

[Drawing 6] It is the outline block diagram showing the image recording equipment concerning the gestalt of other operations of this invention.

[Drawing 7] It is the outline block diagram showing the image recording equipment of this invention further applied to the gestalt of other operations.

[Description of Notations]

1 Recording Head

3 Scan Means

4 Record Form (Record Medium)

7 Migration Means

18 Pulse Motor for Mode Change-over (Dot Pitch Adjustment Means)

29 Central Processing Unit (Control Means)

33 Mode Selection Means

X Main scanning direction

Y The direction of vertical scanning

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[Translation done.]